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WINTER INJURY ON ORNAMENTAL PLANTS IN NEW JERSEY

R. P. White

The past winter has been a severe one on various ornamentals in New Jersey.

EUONYMUS: Practically all Euonymus in New Jersey, particularly the northern portion, is showing severe injury to the foliage, most of which is dead. In some cases plants have been killed to the ground.

BOX: Boxwood is showing severe foliage injury throughout the State and along the shore is showing considerable wood injury. Even plants which were covered during the winter are injured. The suffruticosa variety is more severely injured than the arborescens or sempervirens types. In many cases all the outside foliage is already yellow, and the inner foliage while still green is likewise dead. The lower epidermis is loose on these leaves and the leaves are dry. A large majority of such box plants will recover, since this injury to the twigs and branches is not severe. Along the shore, however, the bark is split open on many older specimen plants and those are killed to the ground.

ROSES: Injury to roses has been very extensive, many varieties being killed to the understock. Other varieties have come through the winter with a surprisingly small percentage of loss. Climbers have suffered most severely.

PRIVET: California privet is showing extensive damage in some sections. Older wood does not seem to be as severely injured as younger growth, except on exposed hedges where severe injury has occurred to the cambium just above the snow. Many hedges will have to be cut down to about six inches.

PLANE TREES: Plane trees are showing some injury in the cambium region of the trunk, just above the snow level. Sections revealed, however, that the cambium is not entirely dead and no lasting damage has been done.

RHODODENDRONS AND AZALEAS: Foliage injury is more severe than usual. Many azaleas are killed outright, and most of them have lost all the flower buds. Certain varieties of rhododendron have lost all bloom for this season, and even the native species have been injured to some extent.

LEUCOTHOE: Foliage injury very severe and some killing back of branches.

ANDROMEDA: Foliage injury in exposed places only.

FORSYTHIA: Practically all bloom killed in north Jersey but from New Brunswick south bloom is now appearing.

HEMLOCK: Tsuga canadensis has come through the winter with little or no injury but T. caroliniana has been injured severely in some exposed situations.

YEW: The value of the Taxus or yew has been enhanced by the excellent manner in which trees of this genus have come through the winter. Little or no injury has been observed except on some Irish yews which have never been considered at all hardy here. Even these will survive although the foliage is badly injured.

IVY: All English ivy in the State has been severely injured and will lose practically all the old foliage. The buds, however, even on exposed walls, have not been injured and no lasting damage has been done.

WISTERIA: Much of last year's growth on some wisteria examined in the northern part of the State has been killed.

APHELENCHOIDES FRAGARIAE ON CAPE COD STRAWBERRIES

J. R. Christie and O. C. Boyd

In strawberry fields near Falmouth, Massachusetts, where Aphelenchoides fragariae had previously been found (Plant Disease Reporter, vol. 16 (11), p. 113; v. 17 (6), p. 61), plants showed pronounced disease symptoms on April 27, 1934. On the farm where the disease was most severe in 1933, the symptoms were even more extensive and pronounced this spring. The number of plants that showed typical symptoms was estimated to be at least 75 to 80 per cent. A microscopical examination of diseased plants showed, in all cases, a high A. fragariae population, with eggs and larvae especially abundant. In five affected plants the number of these parasites was approximately 2,800, 8,620, 7,800, 9,700, and 12,900 respectively. To appreciate the intensity of this infestation one must recall that the nematodes are concentrated in the buds between the leaf primordia or the very small unfolding leaves.

These observations are of interest in view of the unusual severity of the past winter. During the periods of lowest temperatures, there was little or no snow in the Cape Cod region. In spite of this, the nematodes survived the winter and by late April there had been built up in infested plants a large population.

In North Carolina, during the winters of 1930-31 and 1931-32, A. fragariae survived in small numbers, although a few larval individuals could usually be found on every plant which had showed symptoms the previous summer. No information is available regarding how many of these parasites occur on Cape Cod plants during the winter. The high spring populations, however, do not necessarily imply overwintering in large numbers. In experiments with Aphelenchoides parietinus, a species closely related to A. fragariae and resembling it in many respects, 10 females have produced a population of approximately 19,420 individuals in a period of two weeks. On September 20, 1933, the beds on Cape Cod which were severely infected this spring showed only comparatively light symptoms of the disease in either the mother or runner plants. Nema counts for the more heavily diseased plants at that time varied from none to 117 to the plant.

The tendency, in the southern States, for pronounced dwarf symptoms to occur only during the middle and latter part of summer suggested the possibility that even moderately low temperatures suffice to retard the development of the parasite and the production of disease symptoms. This, together with the fact that the disease had not been known to occur in northern States, seemed to indicate that climate might be an effective barrier against its spread northward. The situation on Cape Cod is, of course, entirely out of harmony with such an hypothesis. Nevertheless the fact is that the unfolding leaves and leaf primordia of diseased Cape Cod plants are teeming with thousands of nematodes indistinguishable from A. fragariae which is known to cause pronounced symptoms on southern grown plants where present in much smaller numbers.

LEAF VARIEGATION OF THE BLAKEMORE STRAWBERRY IN LOUISIANA

A. G. Plakidas

A few patches of Blakemores in the strawberry-growing section of Louisiana have been under observation ever since last October when the occurrence of variegated plants was first noted. The yellow condition persisted during fall and winter, but in a relatively mild form, increasing in intensity gradually as the plants began to make a more active growth in the spring, and reaching its maximum intensity about the first week in May. The variegation ranged from mild, mosaic-like mottling in some plants to nearly complete etiolation in others with gradations between the two extremes. The mosaic-like pattern was invariably present irrespective of the degree of etiolation. The affected plants were decidedly smaller than the green ones.

The percentage of yellow plants in different patches varies considerably ranging from 8 per cent in one field to 82 per cent in another, as shown in the following table which shows, in addition to

the percentage of variegated plants in different patches, the source of the plants and the date of their introduction into Louisiana. (May 22).

Field	Source of plants	Date of introduction	Percentage of variegated plants
1	North Carolina	1931 or 1932 (?)	35.4
2	Chattanooga, Tennessee	March 1933	82.0
3	Chattanooga, Tennessee	March 1933	27.0
4	Coastal Plain Sta., N. C.	1929	8.0

NOTES ON APPLE SCAB (VENTURIA INAEQUALIS)

MAINE: Usually the first serious scab infection of our experimental McIntosh trees occurs at the time of blossoming. This year, on May 3, at about the delayed dormant stage, it was easy to find colored ascospores ripe enough to be discharged promptly in water. The leaves when examined had been wet for several hours by a steady rain. During the winter, which was severe as to air temperature, there was a heavy snow cover. (D. Folsom, May 15).

NEW YORK: McIntosh leaves gathered in the Reddick orchard, Ithaca, April 30, showed over half the ascospores colored in 72 per cent of the perithecia. Leaves were placed in moist chamber and trap slides in 4 hours showed abundant germinating ascospores.

Leaves from the western New York samples reported in the Weekly News Letter of April 30, discharged no spores in 2 1/2 hours, very small numbers were found on trap slides after 5 hours. Only small numbers of discharged ascospores were found after 18 hours in moist chamber except in the McIntosh sample from Monroe County in which moderately heavy discharge occurred with small numbers germinated.

These results indicate a moderately heavy discharge of ascospores in the next rain period in orchards near Ithaca where scab was severe last season. If rain periods of sufficient length occur soon a light to moderate discharge is to be expected in western New York in orchards where scab was prevalent in 1933. (W. D. Mills, May 1).

MICHIGAN: Examinations of apple leaves sent in twice weekly from various sections of the State indicated that there was very light discharge a few days previous to April 20. At this time, only a few trees in southwestern Michigan could be considered vulnerable to infection and very little infection is thought to have occurred. In the two weeks from April 23 to May 9, unusually warm, dry weather held ascospore development at a standstill and advanced the fruit buds from the dormant to the pink

stage. General light rains over the State around May 9 resulted in a very light spore discharge and possibly some infection on unsprayed trees. Further general light rains around May 14 resulted in another light spore discharge and a possible infection. Nearly all apples were in full bloom on May 14 at East Lansing. Perithecia are very plentiful in unsprayed orchards and can be found in all stages of maturity. Only a very small percentage show indications of discharge. (Donald Cation, May 17).

WISCONSIN: Apple scab fungus developing very slowly and irregularly owing to drought in most sections of Wisconsin. Spore discharge dependent on rains. (May 8).

Scab spores are maturing in perithecia awaiting favorable rains for discharge. (R. E. Vaughan, May 16).

REPORTS ON VEGETABLE DISEASES

GRAY MOLD ROT OF POTATO IN MAINE: Tubers from a field somewhat blighted by Botrytis cinerea last summer, in storage this spring show some rot characteristic in appearance for gray-mold rot and yielding the fungus in pure culture. In all affected tubers the rot is continuous from the stem end, indicating infection through the stolon. (See Phytopath. 23: 993-999). (Donald Folsom, May 19).

ADDITIONAL NOTE ON THE ENGLISH FORM OF TOMATO SPOTTED WILT IN OREGON: A visit was made to the Oregon coast greenhouses, where the English form of spotted wilt had been discovered. Examination of the plantings there of ornamental plants associated with tomatoes, and of available weeds, showed no indication of a native virus disease which could be used in explaining the occurrence of spotted wilt in the greenhouses. The conclusion from this visit was that the disease must have been introduced on the seed which was imported direct from England. (F. P. McWhorter, May 14).

/The earlier note by McWhorter in the Reporter for April 1, pages 25-26, constitutes the first record of the English form of spotted wilt in the United States. Australian spotted wilt, as already stated in the editorial note appended to McWhorter's article, was reported from Wisconsin by Doolittle. However, the statement that it was reported from Michigan was an error on our part/.

DOWNY MILDEW (PERONOSPORA EFFUSA) OF SPINACH IN VIRGINIA: Field observations during the last three years have shown that the source of inoculum of much of the downy mildew in the spring crop of spinach in the vicinity of Norfolk is the systemically infected plants that live through the winter. Sometimes as many as 10 per cent of the plants in the field are systemically infected and in the spring when the weather becomes favorable for the rapid spread of the disease, these plants are found to be the center of patches of badly diseased plants that are frequently ten feet in diameter.

The theory was advanced this year that there would not be much mildew in the spring crop because the systemically infected plants would have been killed by the unusually severe weather that occurred during the past winter. Examination of fields in March that were known to have contained numerous systemically infected plants in December showed that the diseased plants had survived in the same proportion as the healthy ones and later examination showed that they were serving as important sources of inoculum. (Harold T. Cook, May 15).

SEED-BORNE PEPPER MOSAIC IN VIRGINIA: What appears to be a case of seed-borne pepper mosaic was observed on a hot bed farm at Deep Creek, Virginia. Two varieties of pepper, Worldbeater and California Wonder, were sown in the same bed. At least 50 per cent of the plants of the variety Worldbeater were affected with mosaic while only a few plants of the other variety were diseased and they were located adjacent to the diseased ones. (Harold T. Cook, May 15).

TOBACCO DISEASES

DOWNY MILDEW (blue mold, Peronospora sp.) has been general through Georgia, South and North Carolina. So far it has not been reported from Tennessee. The disease is now appearing generally in the vicinity of Marlboro, Maryland. Weather conditions in the south have been unfavorable for the disease and retarded its development so that the damage to plants has been slight. It was noticeable in Georgia, where the disease developed first, that old beds showed the infection before beds that were made on new ground. This was also true in one of the two previous years that the disease has been under observation.

WILD FIRE (Bacterium tabacum) is general in the Maryland plant beds, the county agent for Prince George County reporting 95 per cent of the beds to be diseased. In some beds many plants have been stunted by the disease and some killed. (E. E. Clayton, May 29).

DOWNY MILDEW ON TOBACCO IN VIRGINIA

Downy mildew is present in Prince Edward, Cumberland, Nottoway, Dinwiddie, Amherst, Halifax, Charlotte, Brunswick, Mecklenburg, Campbell, Pittsylvania, and Bedford counties. The trouble is not as serious as last year. I noted one severe case in Prince Edward County. Three or four severe cases were found in Nottoway County. In the other counties mentioned, the disease was not serious. (James Godkin, May 28).

RUST OF WHEAT AND OATS

C. H. Rogers

Rust on oats and wheat in the central Texas region is very severe this year. Heavy infection began early and during harvest, for the past few days, clouds of spores arise as the harvesting equipment passes through. In every field investigated, approximately 100 per cent of the plants were infected.

One hundred per cent infections occurred in test plots of both rust proof and non-rust proof varieties of oats on the Substation farm at Temple this year. However, the non-rust proof varieties showed an earlier ripening with from 85 to 100 per cent lodging.

The good stands of oats compensate for rust loss. Heads of wheat plants are not well filled. (May 25).

SOME SPECIMENS RECEIVED

Cercospora destructiva on Euonymus in Arkansas, Monticello, Mar. 6, V. H. Young. Det. Aline F. Kempton.

Phoma japonica on Kerria japonica var. flore-pleno, Cincinnati, Ohio, O. T. Wilson. "Associated with dying back of shoots following the cold winter."

Botryosphaeria ribis causing limb canker of Chinese elm (Ulmus parvifolia) in Arkansas, Fayetteville, V. H. Young, Mar. 12. Det. Neil E. Stevens.

Cytospora chrysosperma on Salix discolor, Cincinnati, Ohio, O. T. Wilson. "Causes very serious dying back of this host, also seriously affects Populus spp. Has interfered with the establishment of P. generosa, P. nigra betulifolia, and P. suaveolens przewalskii, furnished by the Division of Foreign Seedand Plant Introduction in 1933."

DUTCH ELM DISEASE

For the past three years as the result of the finding of the Dutch elm disease, due to Graphium ulmi, in Ohio, a careful inspection of areas thought likely to harbor the disease has been carried on by the Bureau of Plant Industry in that State, and as the result of discovery of the more extensive occurrence of the disease in the metropolitan area of New Jersey, New York, and Connecticut, last season more intensive scouting both in these and adjacent States has been carried on by the Bureau of Plant Industry and by the Bureau of Entomology.

To date, 1,415 infected elms have been found in the infested district of approximately 1,400 square miles of the metropolitan area, which apparently represents the only area where rapid spread of the disease is now occurring in this country. One infected elm was found in Baltimore, Maryland, 8 in Cleveland, and one in Cincinnati, Ohio, but

in these two States it is believed that the disease did not secure a foothold and that the prompt eradication of the trees found diseased may have prevented spread. The following records of the discoveries in Ohio are encouraging in that respect:

	1930	1931	1932	1933	All
Cleveland	3	4	0	1	8
Cincinnati	1	0	0	0	1
All	4	4	0	1	9

It is recognized, however, that the inspections so far possible have not been intensive and areas adjacent to port cities where importations of European elm logs have been received are still under suspicion as are also the areas along the railroads over which the logs were hauled and areas adjacent to any veneer manufacturing plants which have used the foreign elm logs.

It is presumed that the disease is spread through the agency primarily of Scolytid bark beetles. Funds available to the Bureau of Entomology for Dutch elm disease control work for the coming fiscal year are probably inadequate for intensive work in the heavily infested area of New Jersey, New York, and Connecticut. Therefore, little if any scouting outside of this area is contemplated.

Insofar as may be practicable in connection with your work, will you not forward for examination specimens of small branches of any elms that you may consider as probably infected with Dutch elm disease? Reporting all suspicious cases particularly where characteristic specimens can be forwarded for examination may enable us to locate any scattered infections that exist without interfering with the active development of eradication work in the Metropolitan area. Following are instructions for collecting material.

If you find elms with wilting leaves or yellow leaves or brown leaves accompanied by brown streaks in the young wood, collect about six specimens of twigs 1/4 to 1 inch in diameter and about six inches in length, which show the sapwood discoloration and mail to the Dutch Elm Disease Control Laboratory, Room 207, Post Office Building, Morristown, New Jersey, together with a statement of the exact location of the tree.

NEW NARCISSUS BOTRYTIS DISEASE IN THE PACIFIC NORTHWEST

Frank P. McWhorter and Henry J. Reynolds

Occasional plants conspicuously diseased with Botrytis narcissicola are of common occurrence in narcissus plantings in the Pacific Northwest every year, the abundance of infections varying with the weather and with soil types. At no time has this established disease ever assumed menacing economic proportions. This statement is made to emphasize the probable importance of the new Botrytis disease recorded here. The new Botrytis appears identical with the fungus described by Dowson (Trans. Brit. Mycol. Soc. 13: 95-103. 1928) under the binomial Botrytis polyblastis. Dowson describes the fungus as an "extraordinary Botrytis,"

because under English conditions the conidia are of gigantic size and produce multiple germ tubes. In the Pacific Northwest, strains of B. narcissicola produce conidia which on the plant average 17 x 11 microns; this new Botrytis produces spores which range up to 90 microns in diameter; they are round, not elliptical and produce as many as 12 germ tubes. Sclerotia conforming to those described by Dowson have been found in decaying leaves.

The malady was first noticed on April 12, when a few strangely diseased Laurens Koster narcissus were found in a small planting in Puyallup, Washington. Large, chocolate-brown lesions on the leaves were delimited above and below with yellow bands. Within ten days, this planting was completely destroyed. On April 16, a further outbreak was observed in a field of Glory of Sassenheim eight miles distant from the first one. In less than a week this field was so completely destroyed that a passerby would not have known that narcissus had been planted there. This complete destruction results from a tissue disorganization suggestive of the enzyme activities of B. elliptica on Lilium candidum.

Inoculations with pure cultures of the fungus isolated from these lesions showed that it takes only five days for the fungus to enter and destroy thick narcissus stems. Under field conditions weakened plants were often attacked by Stagonospora and Ramularia also, making the disease picture complicated, but in cases where the new Botrytis was the principal pathogen we can now record the foliage of more than 200 acres of narcissus completely destroyed. Fortunately, Dowson states that it does not cause a bulb rot. We hope, therefore, that the economic loss will result only from complete defoliation of plants at a time when they should be entering their most important stage of growth.

So far the disease is confined to that part of King County included in the Puyallup Valley and to the government experimental plantings at Bellingham.

To account for this disease and for its extreme severity we can only record the outstanding 1934 climatic features. Usually a Botrytis disease of this kind is associated with excessive precipitation, but the spring of 1934 has been exceptionally warm and dry. The floods of December and January may have predisposed the plants, and the warm weather may have affected the development of the disease. The blooming time of narcissus was advanced 30 days. The disease is so conspicuous that it is inconceivable that it could have occurred here with any abundance in the past and been overlooked. One factor of possible significance is the copious development of the fungus on the flower remains. Some growers think the disease is more severe where the flowers were not removed. Rapid dissemination of the fungus is difficult to account for since the enormous size of the spores precludes easy dissemination by air currents. The prevalent flower infection suggests the accidental help of pollinating insects.

Varieties seriously affected are: Bicolors as a class, especially Spring Glory and Glory of Sassenheim. Some of the Poetaz varieties and Jonquilla species were also completely defoliated.

The plantings of mosaic-free Minister of Talma seem to exhibit true resistance. The behavior of King Alfred and Yellow Trumpets is variable. Usually King Alfred has been mildly injured, but in some instances even King Alfred fields are "flat."

The new Botrytis polyblastis disease is by far the most serious foliage disease of narcissus which we have as yet encountered.